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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/911,963	07/23/2001	James B. Terry	1391-10210	7967

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EXAMINER

LEE, JONG SUK

ART UNIT PAPER NUMBER

3673

DATE MAILED: 04/23/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/911,963

Applicant(s)

TERRY ET AL.

Examiner

Jong-Suk (James) Lee

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period of Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 08 February 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-3, 7, 10-13, 15 and 17-63 is/are pending in the application.
- 4a) Of the above claim(s) 26-32, 36, 37 and 63 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 7, 10-13, 15, 17-25, 33-35 and 38-62 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 July 2001 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 5.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

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DETAILED ACTION

1. The preliminary amendment filed July 23, 2001 has been entered.

Election/Restriction

2. Applicant's election without traverse of Group I directed to claims 1-3, 7, 10-13, 15, 17-25, 33-35 and 38-62 (drawn to drilling system) in Paper No. 4 is acknowledged. Therefore, Claims 26-32, 36, 37 and 63 have been withdrawn from further consideration by the examiner, 37 CFR 1.142(b) as being drawn to a non-elected invention.

Specification

3. The abstract of the disclosure is objected to because the phrase, "The drilling system" in line 1. It is suggested to be --A drilling system--. Correction is required.

Claim Rejections - 35 USC § 112

4. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

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1 5. Claim 58 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing
2 to particularly point out and distinctly claim the subject matter which applicant regards as the
3 invention.

4 Re claim 58; The limitation, "said resistivity antenna" in line 2 lacks clear antecedent basis.

5 Appropriate correction is required.

6

7 ***Claim Rejections - 35 USC § 102***

8 6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the
9 basis for the rejections under this section made in this Office action:

10 A person shall be entitled to a patent unless --

11 (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or
12 on sale in this country, more than one year prior to the date of application for patent in the United States.

13

14 7. Claims 34, 35, 38 and 44-47 are rejected under 35 U.S.C. 102(b) as being anticipated by
15 Pringle et al. (US 5,394,951).

16 Pringle et al. '951 disclose a bottom hole drilling assembly connectable to coiled tubing
17 comprising: a string (20) of composite pipe attached at one end to the bottom hole drilling
18 assembly and having a communication link extending through a wall of the pipe; a downhole
19 motor (30); and a propulsion system attached to the downhole to the drill string further
20 comprising of a drill bit (26), a drill stem attached to a drill bit at one end for drilling the bore hole
21 and attached to an orientation assembly (48), a thruster/prime mover (40) coupled to the pipe

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1 string; an articulated joints/sub (32) articulable three dimensionally and having a first portion
2 (32B) and a second portion (32A) in a manner to permit the second portion to be bent from a
3 coaxial orientation from the first portion (32B), a steerable assembly (34, 36) in engagement with
4 the second portion (32A) and the steerable assembly being in communication with the
5 communication link to bend the articulated joints as to the command of direction change and an
6 orientation assembly sending signals through the data transmission conduit/communication link
7 (20) to control (56, 58) and the steerable assembly, prime mover receiving signals from the
8 control to move the drill bit within the borehole in response to the signals, the propulsion system
9 being powered by the circulation fluids circulated through the flow bore and up an annulus formed
10 by the composite tubes and inherently the composite tubes being engineered to withstand axial
11 and yield stress placed on the string (see Fig. 1; col.2, lines 53-68; col. 3, lines 1-59; col.5, lines
12 10-43).

13
14 ***Claim Rejections - 35 USC § 103***

15 8. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness
16 rejections set forth in this Office action:

17 (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in
18 section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are
19 such that the subject matter as a whole would have been obvious at the time the invention was made to a person
20 having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the
21 manner in which the invention was made.

22 This application currently names joint inventors. In considering patentability of the claims

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under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103© and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

9. Claims 1, 2, 10, 12, 13, 15, 17-19, 21, 23-25, 38-42, 48-52, 57, 61 and 62 are rejected under 35 U.S.C. 103(a) as being unpatentable over Horstmeyer et al. (US 4,463,814) in view of Walling (US 4,336,415).

Horstmeyer et al. disclose a down-hole drilling apparatus comprising: a composite tube (14) which is a tube/string of tubular members having a portion (32) made of non-metal/plastic, data transmission conductor/control wires (24), instrumentation wires (26), power cables (28) and abrasion-proof coverings (34); a drill bit/ a member of displacing formation (36); a power section/electric motor (60); a bottom hole assembly (21) attached downhole to the string including a well apparatus and a propulsion system/thrusters, pistons and housings (39, 52; 104; 106, 130); The direction of drilling can be altered by the operation of thruster assemblies (39, 52) serving as a three dimensional steering apparatus (see Figs. 1-14; col.3, lines 51-68; col.4, lines 1-68; col.5, lines 1-15; col.7, lines 2-14; col.8, lines 7-56; col.11, lines 24-33).

However, Horstmeyer et al. fails to disclose or fairly suggest the fibers wrapped in a predetermined pattern around the liner of the composite tube. Walling discloses a flexible production tubing comprising of a liner (32) with a flowbore and fibers (60) wrapped in a

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predetermined braided pattern around the liner (32), a number of power conductors (42, 44, 46, 48) and a signal conductor bundle (50), and high tensile strength strands (36) to carry axial loads (see Figs. 1-5; col.5, lines 13-68; col.6, lines 1-31).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Horstmeyer et al.'s composite tube with the composite flexible tubing as taught by Walling in order to enhance the flexibility of the composite tube and to convey fluids along plural flow paths while withstanding substantial tension loading.

10. Claims 17, 19, 20, 33, 47, 55 and 56 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pringle et al.'951 in view of Walling. The teachings of Pringle et al.'951 have been discussed above.

However, Pringle et al.'951 fails to disclose or fairly suggest the fibers wrapped in a predetermined pattern around the liner of the composite tube. Walling discloses a flexible production tubing comprising of a liner (32) with a flowbore and fibers (60) wrapped in a predetermined braided pattern around the liner (32), a number of power conductors (42, 44, 46, 48) and a signal conductor bundle (50), and high tensile strength strands (36) to carry axial loads as discussed in Paragraph No. 9.

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to replace Pringle et al.'951's composite tube with the composite flexible

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1 tubing as taught by Walling in order to enhance the flexibility of the composite tube and to convey
2 fluids along plural flow paths while withstanding substantial tension loading.

3
4 11. Claim 43 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pringle et al.'951
5 in view of Colin et al. (US 4,568,145). The teachings of Pringle et al.'951 have been discussed
6 above.

7 However, Pringle et al.'951 fails to disclose a connector for connecting lengths of the
8 pipe. Colin et al. disclose a connection device for a cable incorporating optical fibers and metal
9 conductors including the connector assembly as depicted in Fig. 1 (see Figs.1-3; col.2, lines 1-35).

10 Therefore, in view of Colin et al.'145, it would have been obvious to one of ordinary skill
11 in the art at the time the invention was made to add the connector between the end of the
12 composite umbilical in order to efficiently provide the required length of the umbilical composite
13 at the site.

14
15 12. Claims 3, 7 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over
16 Horstmeyer et al. as modified by Walling, as applied to claim 1, further in view of Williams et al.
17 (US 5,913,337). The teachings of Horstmeyer et al. modified by Walling have been discussed
18 above.

19 However, the teachings of Horstmeyer et al. modified by Walling fail to disclose the range

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1 of Young's modulus and density of the composite umbilical and a metallic conductor embedded in
2 a wall of the composite umbilical. Williams et al.'337 disclose a spoolable composite tubular
3 member with energy conductors comprising of a composite umbilical including non-metallic/fibers
4 having a modulus of elasticity which is 100,000 psi or greater, and including the metallic
5 conductor (21) embedded in the wall of the composite umbilical (see Fig.11; col.3, lines 4-10;
6 col.4, lines 25-34; col.12, lines 46-60).

7 Therefore, it would have been obvious to one of ordinary skill in the art at the time the
8 invention was made to further modify the composite tube of Horstmeyer et al., as modified by
9 Walling, by replacing with the composite umbilical tube having a metallic conductor and a desired
10 modulus of elasticity as taught by Williams et al.'337 in order to enhance stiffness of the
11 composite umbilical by providing a uni-directional longitudinal stiffening material in the opposite
12 sidewalls of the composite umbilical and still provide a desired elasticity limit.

13 With respect to the density parameters for the composite umbilical, it would have been
14 obvious to one of ordinary skill in the art at the time the invention was made to have provided
15 Horstmeyer et al.'s tube modified by Walling with a certain density in order to provide a tube that
16 is light and easy to handle in spooling the composite umbilical.

17
18 13. Claims 22, 59 and 60 are rejected under 35 U.S.C. 103(a) as being unpatentable over
19 Horstmeyer et al. as modified by Walling, as applied to claim 21, further in view of Colin et

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1 al.'145. The teachings of Horstmeyer et al. modified by Walling have been discussed above.

2 However, the teachings of Horstmeyer et al. modified by Walling fails to disclose a
3 connector for connecting lengths of the pipe. Colin et al.'145 disclose a connection device for a
4 cable incorporating optical fibers and metal conductors including the connector assembly as
5 depicted in Fig. 1 (see Figs.1-3; col.2, lines 1-35).

6 Therefore, in view of Colin et al.'145, it would have been obvious to one of ordinary skill
7 in the art at the time the invention was made to further modify the composite tube of Horstmeyer
8 et al., as modified by Walling by adding the connector device between the end of the composite
9 umbilical in order to efficiently provide the required length of the umbilical composite at the site.

10
11 14. Claims 53 and 58 are rejected under 35 U.S.C. 103(a) as being unpatentable over
12 Horstmeyer et al. as modified by Walling, as applied to claim 17 and 21 respectively, further in
13 view of Wu (US 5,438,267). The teachings of Horstmeyer et al. modified by Walling have been
14 discussed above.

15 However, the teachings of Horstmeyer et al. modified by Walling fails to disclose a
16 resistivity antenna being connected to the electronic section of the bottom hole assembly. Wu
17 discloses a bottom hole assembly including a processor/electronic section (51) having an
18 resistivity antenna as receivers (22, 26) to measure the resistivity of the well (see Fig. 1; col. 5,
19 lines 21-68; col.6, lines 1-20; col.8, lines 1-19).

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1 Therefore, in view of Wu, it would have been obvious to one of ordinary skill in the art at
2 the time the invention was made to further modify the bottom hole assembly of Horstmeyer et al.,
3 as modified by Walling by adding the receiver and processor to the system in order to enhance the
4 control of the bottom hole assembly.

5
6 15. Claim 54 is rejected under 35 U.S.C. 103(a) as being unpatentable over Pringle et al.'951
7 as modified by Walling, as applied to claim 17, and further in view of Dismukes (US 4,646,856).
8 The teachings of Pringle et al.'951 modified by Walling have been discussed above.

9 However, The teachings of Pringle et al.'951 modified by Walling fails to disclose or fairly
10 suggest the string of tubular members engineered to cause the string to achieve neutral buoyancy
11 in the fluids of the well and the specific density of the umbilical composites. Dismukes discloses
12 tubulars for directional drilling comprising of drill string/conduit, the conduit including the
13 cylinder designed to provide flotation to the conduit to cause it to be neutrally buoyant in drilling
14 fluid of the well (see Figs. 7-10; col.5, lines 30-56).

15 Therefore, it would have been obvious to one of ordinary skill in the art at the time the
16 invention was made to further modify the composite tube of the Pringle et al.'951, as modified by
17 Dismukes, by including the cylinder in order to provide substantial neutral buoyancy to the
18 umbilical in the drilling fluids.

19

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Conclusion

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Other references cited disclose the composite tubes/umbilical in the well system.

17. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jong-Suk (James) Lee whose telephone number is (703) 308-6777. The examiner can normally be reached between the hours of 6:30AM to 3:00PM Monday thru Friday. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Heather C. Shackelford, can be reached on (703) 308-2978. The fax phone number for this Group is (703) 305-3597.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-2168.

J. Lee /jjl
April 18, 2002


Jong-Suk (James) Lee
Patent Examiner
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